SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE

PAGE 1 of 9		
APPL. NO.	DATE:	
505541 & -42	2/16/10	
PROCESSED BY	CHECKED BY	
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APPLICATION PROCESSING AND CALCULATIONS

EVALUATION REPORT FOR PERMIT TO OPERATE

Applicant's Name: INSULFOAM LLC Facility ID: 151843

Mailing Address: 6004 N. WESTGATE BLVD., SUITE 120

TACOMA, WA 98406

Equipment Location: 5635 SCHAEFER AVENUE

CHINO, CA 91710

EQUIPMENT DESCRIPTION

Modifications are shown in bold italic, original in bold strike-though.

Appl. No. 505541 - Change of Condition (B163.1 and E193.6)

Equipment	ID No.	Connected to	RECLAIM Source Type/ Monitoring Unit	Emission and Requirements	Conditions
Process 1: Polystyrene Foam	Block Mfg	3.			P2.1, P13.1, P42.1
System 1: Polystyrene Foam	Expansion	1			
HOPPER, NO. 1, POLYSTYRENE BEADS A/N: 473340 505541	D23	C58		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
FEEDER, NO. 1, SCREW, POLYSTYRENE BEAD A/N: 473340 505541	D34	C58		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
FOAM EXPANSION, NO. 1, PRE- EXPANDER, HIRSCH, MODEL VACUTRANS 12000, WITH FILLING CAN A/N: 473340 505541	D1	C58		VOC: (9) [RULE1175, 5-13-1994; RULE 1175, 9-7-2007]	B163.1, D29.2, D323.1, K67.4
FEEDER, NO. 1, PRE-EXPANDED POLYSTYRENE A/N: 473340 505541	D25	C58		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
DRYER, FLUIDIZED BED, NO. 1 A/N: 473340 <i>505541</i>	D2	C58		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
CONVEYOR, PNEUMATIC, NO. 1, PRE-EXPANDED POLYSTYRENE A/N: 473340 505541	D24	C58		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
HOPPER, NO. 2, POLYSTYRENE BEADS A/N: 473340 505541	D27	C58		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
FEEDER, NO. 2, SCREW, POLYSTYRENE BEAD A/N: 473340 505541	D26	C58		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1



ENGINEERING AND COMPLIANCE

PAGE 2 of 9 APPL. NO. DATE: 505541 & -42 2/16/10 PROCESSED BY CHECKED BY S. JIANG D. GORDON

APPLICATION PROCESSING AND CALCULATIONS

FOAM EXPANSION, NO. 2, PRE- EXPANDER, HIRSCH, MODEL VACUTRANS 12000, WITH FILLING CAN A/N: 473340 505541	D3	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	B163.1, D29.2, D323.1, K67.4
FEEDER, NO. 2, PRE-EXPANDED POLYSTYRENE A/N: 473340 505541	D28	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
DRYER, FLUIDIZED BED, NO. 2 A/N: 473340 <i>505541</i>	D4	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
CONVEYOR, PNEUMATIC, NO. 2, PRE-EXPANDED POLYSTYRENE A/N: 473340 505541	D29	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
System 2: Pre-expanded Poly	ystyrene St	orage		
AGING ROOM, PRE-EXPANDED POLYSTYRENE, 18 STORAGE BAGS, 3,750 CU. FT. EACH WITH BAGFARM HEATING UNIT A/N: 473340 505541	D7	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1, E193.1, E193.4, E193.6
CONVEYOR, PNEUMATIC, VIRGIN PRE-EXPANDED POLYSTYRENE A/N: 473340 505541	D35	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
System 3: Polystyrene Block	Molding			
MIXER, NO. 1, PRE-EXPANDED POLYSTYRENE, PELLET MIXING STATION, WITH 3 BAGS (VIRGIN, REGRIND, AND MOLD FILL), 800 CU. FT. EACH A/N: 473340 505541	D21	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
MIXER, NO. 2, PRE-EXPANDED POLYSTYRENE, PELLET MIXING STATION, WITH 3 BAGS (VIRGIN, REGRIND, AND MOLD FILL), 800 CU. FT. EACH A/N: 473340 505541	D52	C58	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
PRESS, BLOCK MOLDING, IDDROPRESS, MODEL 24, WITH FILL BLOWER, VACUUM EXHAUST, DRAIN VENT, AND PRESSURE EXHAUST A/N: 473340 505541	D56	C58	VOC: (9) [RULE1175, 5-13-1994; RULE 1175, 9-7-2007]	D29.2
PRESS, BLOCK MOLDING, NUOVA IDDROPRESS, VERTICAL BLOCK MOLD, WITH FILL BLOWER, DRAIN VENT, VACUUM AND PRESSURE EXHAUST A/N: 473340 505541	D63	C58	VOC: (9) [RULE1175, 5-13-1994; RULE 1175, 9-7-2007]	D29.2
System 4: Polystyrene Foam	Block Mol	ding		
CUTTER, WITH ROLLER CONVEYER A/N: 473340 505541	D39		PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1



ENGINEERING AND COMPLIANCE

PAGE 3 of 9 APPL. NO. DATE: 505541 & -42 2/16/10 PROCESSED BY CHECKED BY S. JIANG D. GORDON

APPLICATION PROCESSING AND CALCULATIONS

CUTTER, WITH ROLLER CONVEYER A/N: 473340 505541	D41	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
CUTTER, WITH ROLLER CONVEYER A/N: 473340 505541	D43	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
CUTTER, WITH ROLLER CONVEYER A/N: 473340 505541	D45	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
CUTTER, SHAPE A/N: 473340 505541	D47	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
System 5: Polystyrene Foam	Scrap Recovery		
GRINDER, SCRAP A/N: 473340 505541	D11	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
GRINDER, SCRAP A/N: 473340 505541	D12	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
SCREEN, CLASSIFYING, SCRAP FOAM A/N: 473340 505541	D57	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
CONVEYOR A/N: 473340 <i>505541</i>	D62	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
BULK MATERIAL LOAD/UNLOAD STATION, 6 RECYCLING BAGS, 3,750 CU. FT. EACH, AND 2 SMALLER BAGS A/N: 473340 505541	D13	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1
CONVEYOR, PNEUMATIC, SCRAP A/N: 473340 505541	D61	PM: (9) [RULE 405, 2-7-1986]; VOC: (9) [RULE1175, 5-13- 1994; RULE 1175, 9-7-2007]	D29.2, D323.1

Appl. No. 505542 – Minor Title V Facility Permit Revision

Minor Revision of Title V Facility Permit per Rule 301(1)(7).

PERMIT CONDITIONS

The following Permit Conditions are changed:

B163.1 The operator shall only use raw materials containing the following:

Raw EPS bead with a pentane content less than or equal to 3.6% by weight.

Flint Hills Type 54 raw bead that is used to produce either 1.0 pound per cubic foot (*pcf*) virgin product (1.0 MV), 1.0 **pound per cubic foot** *pcf* recycled product (1.0 MG) or 1.25 **pound per cubic foot** *pcf* recycled product (1.25 MG).

Loyal Type FS raw bead that is used to produce either 1.0 **pound per cubic foot** *pcf* virgin product (1.0 MV), 1.0 **pound per cubic foot** *pcf* recycled product (1.0 MG) or 1.25 **pound per cubic foot** *pcf* recycled product (1.25 MG).



ENGINEERING AND COMPLIANCE

PAGE 4 of 9 APPL. NO. DATE: 505541 & -42 2/16/10 PROCESSED BY CHECKED BY S. JIANG D. GORDON

APPLICATION PROCESSING AND CALCULATIONS

BASF Type BFL raw bead (3.9% pentane) that is used to produce either 1.5 pcf recycled product (1.5 MG), 2.0 pcf virgin or recycled product (2.0 MV or 2.0 MG) or 3.0 pcf virgin or recycled product (3.0 MV or 3.0 MG).

Raw bead with a pentane content greater than 3.6% by weight and not exceeding a maximum of 5.2% by weight, other than the raw bead types referenced above, only for a purpose of conducting a source test to demonstrate compliance with *the SIP approved* Rule 1175. The operator may only conduct the test upon submission of a test plan and written approval by **EPA Region IX** *the District*. The operator shall notify the District 10 days prior to the test and submit the report within 30 days after the test.

At least 60% of the annual EPS block throughput shall be manufactured with raw bead with a pentane content less than or equal to 3.6% by weight low-pentane beads, and the remainder shall be manufactured with raw bead midpentane beads, which include that are Flint Hills Type 54, Loyal Type FS, and/or bead with a pentane content between 3.6% and 5.2% by weight other types of beads used for a compliance source testing purpose.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[RULE 1175, 5-13-1994; Rule 1175, 9-7-2007; CONSENT DECREE CIVIL NO. 5:07CV01092SGLOP, 8-29-2007; RULE CONSENT DECREE CIVIL NO. 5:07CV01092SGLOP, 7-20-2008]

[Devices subject to this condition: D1, D3]

E193.6 The operator shall operate, and maintain this equipment according to the following requirements:

All Loyal Type FS beads shall be aged for a minimum of 18 hours in this equipment before they are used in the block molding process.

All Flint Hills Type 54 beads shall be aged for a minimum of 24 hours in this equipment before they are used in the block molding process.

All BASF Type BFL beads shall be aged for a minimum of 6.4 hours in this equipment whenever they are used to produce 1.5 pcf products.

All BASF Type BFL beads shall be aged for a minimum of 7.9 hours in this equipment whenever they are used to produce 2.0 pcf products.

All BASF Type BFL beads shall be aged for a minimum of 9.0 hours in this equipment whenever they are used to produce 3.0 pcf products.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[RULE 1175, 5-13-1994; Rule 1175, 9-7-2007; CONSENT DECREE CIVIL NO. 5:07CV01092SGLOP, 8-29-2007; RULE CONSENT DECREE CIVIL NO. 5:07CV01092SGLOP, 7-20-2008]

[Devices subject to this condition: D7]

BACKGROUND/HISTORY

Insulfoam LLC. (Insulfoam) manufactures Expanded PolyStyrene (EPS) foam block or panel products. The facility is a Title V facility, but not a RECLAIM facility. Insulfoam facility was previously known as

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE

PAGE 5 of 9 APPL. NO. DATE: 505541 & -42 2/16/10 PROCESSED BY CHECKED BY S. JIANG D. GORDON

APPLICATION PROCESSING AND CALCULATIONS

Premier Industries (facility ID: 25318) and the Title V facility permit was re-issued to Premier Industries on 4/28/2006.

Insulfoam's EPS Manufacturing Operation is subject to Rule 1175. In fact, Insulfoam is the only EPS block molder currently in operation within the District. Prior to September 7, 2007, Rule 1175 only allowed the block molder to either meet with (c)(2) - 2.4 lb VOC emissions / 100 lb raw materials including the residual blowing agent in product, or to meet with (c)(4) - 90% emission collection and 95% destruction efficiency by the control equipment and a minimal 48-hour emission controlled product storage. Insulfoam's EPS block manufacturing system could not meet with R1175 with (c)(2) option when using the raw beads with pentane contents greater than 3.6% w/w. In addition, Insulfoam could not meet with (c)(4) because the facility does not have the 48-hour product storage capability.

On September 7, 2007, Rule 1175 was amended and added (c)(4)(iii) to allow the block molders to comply with (c)(4) with an alternative option -(c)(4)(iii) - 93% overall control, and the annual manufacturing throughput using at least 60% low-pentane beads and the remainder with mid-pentane beads. The alternative compliance option relieves the block molders of the 48-hour storage requirement in a trade-off of more stringent overall control efficiency.

Insulfoam is in the EPA Title V program. In addition, Insulfoam had a Consent Decree (CD, Case No. ED CV 07-01092 SGL), which was lodged on 08-29-2007, and subsequently amended on 07-20-2008. This CD was terminated on October 09, 2009. However, paragraph 21 of this CD requires Insulfoam to comply with the Clean Air Act (CAA) and the SIP approved version of Rule 1175 at all times after termination of the CD. Since the 9/7/2007 version of Rule 1175 was submitted to the EPA review, and it has not yet been SIP approved, Insulfoam is still subject to 5/13/1994 version of Rule 1175, and does not have the alternative compliance option provided by (c)(4)(iii) in the 9/7/2007 version of Rule 1175. Insulfoam still has to comply with Rule 1175(c)(2) until the 9/7/2007 version of Rule 1175 is SIP approved.

During the consent decree period, Insulfoam has demonstrated the compliance with Rule 1175(c)(2) using two additional types of raw beads (> 3.6% pentane w/w), Loyal Type FS and Flint Hills Type 54, when used to produce certain products and under certain operating conditions. These two types of raw beads were allowed to be used in production under application number 473340.

On April 28, 2009, Insulfoam tested a new type of raw beads, BASF Type BFL (3.9% pentane w/w), in production of certain types of products, and the test results demonstrated compliance with Rule 1175(c)(2). This test report was approved by M&STE on June 5, 2009 (ref. no. 09041). The usage of this bead was conditionally approved by the EPA on September 9, 2009. (See attached EPA letter.) In order to be allowed to use this bead in their production, Insulfoam submitted the following expedited applications on January 20, 2010.

Appl. No.	<u>Type</u>	Previous Permit No.	<u>Equipment</u>
505541	Change-of-Condition	G1361	Polystyrene Foam Expansion/Molding
505542	Plan	N/A	Title V Permit Revision

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE

PAGE 6 of 9		
APPL. NO.	DATE:	
505541 & -42	2/16/10	
PROCESSED BY	CHECKED BY	
S. JIANG	D. GORDON	

APPLICATION PROCESSING AND CALCULATIONS

<u>Appl. No. 505541</u> is submitted as an expedited class-I change-of-condition application for the polystyrene foam expansion/molding process. The applicant proposed to change the conditions to allow a new type of raw beads, BASF Type BFL, to be used in their production.

Appl. No. 505542 is submitted as a plan for the minor revision of the Title V permit as specified in Rule 301.

PROCESS DESCRIPTION

Insulfoam produces expanded polystyrene (EPS) blocks and boards. These products are used in the construction and building materials industry for insulation and specialty applications such as columns and decorative facades.

- 1) Raw Material Receiving The raw materials for the process are EPS resins, called beads, which have a sand-like appearance. The resins are shipped to the facility in lined 1000-pound Gaylord boxes or lined 2200- pound bags. EPS resin is impregnated with a pentane blowing agent. Depending on the amount of pentane contents, the EPS bead is categorized to Low-Pentane Bead or Mid-Pentane Bead. Low-Pentane Bead is defined as the pentane content with an upper limit less than 4.0 percent by weight. Mid-Pentane Bead is defined as the pentane content within the range of 4.0 to 5.2 percent by weight. The pentane content is certified upon delivery by an accompanying bead lot manufacturer's Certificate of Analysis prior to shipment.
- 2) Pre-Expansion Pre-expansion is performed in two parallel lines of equipment. Boxes and bags of EPS beads are opened and allowed to air out for 5-10 minutes. Then they are dumped into a hopper (D23, D27). The beads then are augured (D34, D26) into a small hopper (filling can) (D1, D3), where the bead charge is measured then introduced into the Pre-Expander (D1, D3). With steam and mechanical agitation, the beads are pre-expanded into BB-sized particles called "prepuff". The steam softens the polymer and causes the pentane blowing agent to expand inside the bead and blow outward. Following the pre-expansion cycle, the prepuff is dumped via a feeder (D25, D28) directly from the pre-Expander into an integral fluidized bed drier (D2, D4), where air is blown through the prepuff to cool and dry it. Following drying, the prepuff is blown through a takeaway blower (D24, D29) to the aging bags (D7) for stabilization and aging.
- 3) Prepuff Bead Aging Prepuff is blown by the take-away blowers (D24, D29) to the aging Room (D7) (also known as "bag farm"), where the prepuff is aged and stabilized for 4-12 hours. The prepuff is stored in eighteen 3750-cubic foot bags, located inside of the Aging Room. The aging step allows the temperature to equalize and the prepuff to achieve the proper conditions for molding. During the prepuff aging, a portion of the pentane is emitted into the Aging Room.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE

PAGE 7 of 9 APPL. NO. DATE: 505541 & -42 2/16/10 PROCESSED BY CHECKED BY S. JIANG D. GORDON

APPLICATION PROCESSING AND CALCULATIONS

4) Molding – Stabilized prepuff is pneumatically conveyed (D35) from the Aging Room to the mixing station (D21, D52) at each of the two block molds (D56, D63). Each mixing station contains three bags: virgin bead bag, regrind bag, and mold fill bag. Specifically, the prepuff is conveyed to the virgin bead bag. The regrind (recycled scrap bead) from Scrap Recovery (see below), is conveyed to the regrind bag via a pneumatic conveyor (D61).

When producing virgin foam block, virgin beads are transferred mechanically via auger from the virgin bead bag to the mold fill bag. When producing "scrap foam block", the virgin bead bag and the regrind bag, respectively, to the mixing station, where they are combined then blown to the mold fill bag. From the mold fill bag, the beads are vacuum fed into the block mold (D56, D63) using a mold fill blower.

Once in the mold, the beads are subjected to a number of steaming and vacuum cycles which fuse the prepuff into a foam billet or block. The molding cycle consists of the following steps: (1) initial steam/vacuum, with mold cavity evacuated to vacuum system; (2) final steam, with mold cavity pressurized with steam and held, no evacuation or venting; (3) mold pressure exhaust, with exhaust vent opened to instantaneously depressurize mold, the shut; (4) dewatering, when exhaust vents are opened and the mold evacuated via fill blower; (5) final vacuum, with mold evacuated and collected via vacuum system; and (6) open mold/eject block.

- 5) Cutting and Packaging/Shipping Some of the foam billets are shipped in the original molded block form. Other blocks are set aside and allowed to stabilize for 24 to 96 hours, then are cut into various product sizes and shapes. The cutters with roller conveyors (D39, D41, D43, D45) cut a block into boards by conveying the block through the hot wire. The Shape Cutter (D47) cuts a block by holding the block stationary and moving the hot wire as directed by a computer. The blocks or cut products may be directly packaged and shipped to the customer, or placed in inventory storage pending shipment.
- 6) Scrap Recovery The cutting of foam blocks into boards and shapes generates a significant amount of foam scrap that is not directly saleable. The majority of this scrap is collected, reduced in size, then recycled to the regrind bags at the mold mixing stations (D21, D52) to produce "scrap foam blocks". The facility also receives shipments of scrap from outside sources. These outside sources are primarily Insulfoam's block customers, who purchase the blocks and cut them as necessary at their own facilities. Thereby generating scrap that Insulfoam has agreed to accept.

The scrap foam is placed into grinders (D11, D12) to reduce the scrap into smaller pieces suitable for on-site recycling. This "regrind" is processed through a screen (D57) to ensure proper sizing, and stored in regrind storage bags (D13).



ENGINEERING AND COMPLIANCE

PAGE 8 of 9		
APPL. NO.	DATE:	
505541 & -42	2/16/10	
PROCESSED BY	CHECKED BY	
S. JIANG	D. GORDON	

APPLICATION PROCESSING AND CALCULATIONS

In regards of the production of "scrap foam blocks", which are made using a percentage of recycled regrind material, the regrind is pneumatically conveyed (D61) from the regrind storage bags (D13) to the regrind bag at the mold mixing station (D21, D52). There, the regrind is mixed with "virgin" bead prior to charging to the block mold (D56, D63).

Some scrap generated at Insulfoam is not suitable for recycling, and is packaged and removed from the facility to offsite recyclers or waste landfills.

This facility operates 24 hrs/day, 7 days/wk, and 52 wks/yr.

EMISSION CALCULATIONS

There is no emission calculation required for the proposed permit condition changes.

EMMISSION SUMMARY

	Hourly (lbs/hr)			30 day ave. (lbs/day)	30 day NSR (lbs/day)
VOC R1	94.6	2270.4	826,426	2270	2270
VOC R2	9.46	227.0	82,643	227	227

RULES AND REGULATIONS EVALUATION

Rule 212:	Standards for Approving Permits – The facility is not located within 1,000 feet of a K-
	12 school, and there is no emission increase with this modification. A Public Notice is not
	required.

<u>Rule 401</u>: Visible Emissions – Compliance is expected from well maintained and properly operated equipment.

<u>Rule 402</u>: Public Nuisance – With proper operation and maintenance, the equipment is not likely to create a public nuisance.

Rule 1175: Control of Emissions from the Manufacture of Polymeric Cellular (Foam) Products

Based on source tests performed, compliance with this rule is expected if all operating permit conditions are met.

REG XIII: New Source Review - There are no emission increase associated with this change of condition application. No emission offset is required for these applications.

Rule 1401: There is no toxic air contaminant associated with this application. Risk assessment is not required.

Reg XXX: Title V Permit

Insulfoam LLC (Facility ID: 151843) has an active Title V permit. Based on the above evaluation, the proposed permit condition change will not result in an increase in emission



ENGINEERING AND COMPLIANCE

APPLICATION PROCESSING AND CALCULATIONS

PAGE 9 of 9		
APPL. NO.	DATE:	
505541 & -42	2/16/10	
PROCESSED BY	CHECKED BY	
S. JIANG	D. GORDON	

of any criteria air pollutant or any air toxic contaminant. The proposed revision is to allow the company to use a new type of raw beads which previously tested and showed compliance with Rule 1175(c)(2). Therefore, the proposed modification is considered a Minor Permit Revision of Insulfoam's Title V Facility Permit. Application No. 505541 is subject to a 45-day EPA review prior to final revision of the Title V Facility Permit.

Consent Decree – Case No. ED CV 07-01092 SGL (OPx)

This consent decree (CD) was lodged on 08-29-2007, and subsequently amended on 07-20-2008. This CD was terminated on October 09, 2009. Paragraph 21 of this CD requires Insulfoam to comply with the Clean Air Act (CAA) and the SIP approved version of Rule 1175 at all times after termination of the CD. Since the 9/7/2007 version of Rule 1175 was submitted to the EPA review, and it has not yet been SIP approved, Insulfoam is still subject to 5/13/1994 version of Rule 1175, and does not have the alternative compliance option provided by (c)(4)(iii) in the 9/7/2007 version of Rule 1175.

Application No. 505541 was submitted to allow the company to use a new type of raw beads which previously tested and showed compliance with Rule 1175(c)(2). Since Rule 1175(c)(2) is in the SIP approved version of Rule 1175 (Amended 5/13/1994), compliance is expected.

CONCLUSION AND RECOMMENDATIONS

Based on this evaluation, it is expected that the subject equipment will be operated in compliance with all applicable District Rules and Regulations. The Permit to Operate is recommended to be issued.